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INTERCONNECTION SYSTEM  
FOR TRANSMITTING POWER  
BETWEEN ELECTRICAL SYSTEMS

ABSTRACT OF THE DISCLOSURE

An electrical interconnection system (100) comprises a variable frequency rotary transformer (102) and a control system (104). The control system (104) adjusts an angular position of the rotary transformer (102) so that measured power ( $P_1$ ) transferred from a first electrical system (22) to a second electrical system (24) matches an inputted order power ( $P_o$ ). The rotary transformer (102) comprises a rotor assembly (110) and a stator (112), with the control system (104) adjusting a time integral of rotor speed over time. The control system (104) includes a first control unit (107) and a second control unit (108). The first control unit (107) compares the input order power  $P_o$  to the measured power  $P_1$  to generate a requested angular velocity signal  $\omega_o$ . The second control unit (108) compares the requested angular velocity signal  $\omega_o$  to a measured angular velocity signal  $\omega_r$  of the rotary transformer to generate a converter drive signal  $T_o$  to a torque control unit (106), thereby controlling the angular positioning ( $\theta_r$ ) of the rotor assembly (110) relative to the stator (112). In various embodiments, the torque control unit (106) is integrated in the rotor assembly (110) and stator (112) of the rotary transformer (102).